

Serial No. 10/035,400
November 16, 2004
Reply to the Office Action dated August 18, 2004
Page 4 of 9

REMARKS/ARGUMENTS

Claims 1-3 are pending in this application. By this Amendment, Applicants AMEND claims 1-3.

The Examiner objected to the Drawings for allegedly failing to show every feature of the claims. Although Applicants disagree, Applicants have canceled the feature objected to by the Examiner from claim 1 in order to expedite prosecution of the present application. Accordingly, Applicants respectfully request reconsideration and withdrawal of this objection to the Drawings.

The Examiner rejected claims 1-3 under 35 U.S.C. § 112, first paragraph as allegedly containing subject matter that was not described in the Specification in such a way as to reasonably convey to one skill in the relevant art that the inventors, at the time of the application was filed, had possession of the claimed invention. As noted above, Applicants have canceled the feature objected to by the Examiner and rejected in this rejection from claim 1 in order to expedite prosecution of the present application. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-3 under 35 U.S.C. § 112, first paragraph.

The Examiner rejected claims 1-3 under 35 U.S.C. § 103(a) as being unpatentable over Brebels et al. (U.S. 5,675,295) in view of Kornrumpf et al. (U.S. 5,355,102), further in view of Carey et al. (U.S. 5,219,787), further in view of Ohya et al. (U.S. 5,686,172), and further in view of Trinh et al. (U.S. 4,490,733). Applicants respectfully traverse the rejection of claims 1-3.

Claim 1 has been amended to recite:

A method of producing a thin film circuit board used as a milli-wave or micro-wave module, the method comprising steps of:

cleaning a substrate comprising dielectric ceramic, and having a thickness of 0.05 mm to 2 mm and a flexural strength of 500 kgf/cm² to 4000 kgf/cm²;

forming a conductor film in a predetermined pattern on the substrate, said conductor film including at least one selected from Cu, Au, Ag, Al, Ni, Ti, Cr, Ni-Cr, Nb, and V;

Serial No. 10/035,400
November 16, 2004
Reply to the Office Action dated August 18, 2004
Page 5 of 9

forming an insulating film on the substrate to cover the conductor film, said insulating film comprising at least one organic resin selected from polyimide, epoxy resins, benzocyclobutene resins, acrylic resins, and cyclic olefin resins, and having an area of 5 cm² or less per pattern and a stress of 15 MPa to 60 MPa;

curing and patterning the insulating film; and
repeating the insulating film forming step and the insulating film curing and patterning step at least once; wherein
the insulating films have a total thickness of 20 μ m or greater.
(emphasis added)

Applicants' claim 1 recites the steps of "curing and patterning the insulating film" and "repeating the insulating film forming step and the insulating film curing and patterning step at least once."

With the improved features and method steps of claim 1, Applicants have been able to provide an improved method of producing a thin film circuit board even when an insulating film comprising an organic resin is thickened (see, for example, the paragraph bridging pages 3 and 4 of the Specification).

Applicants amended claim 1 to recite the steps of "curing and patterning the insulating film" and "repeating the insulating film forming step and the insulating film curing and patterning step at least once."

Brebels et al. fails to teach or suggest any step of curing. Thus, Brebels et al. clearly fails to teach or suggest the step of "curing and patterning the insulating film," and certainly fails to teach or suggest the step of "repeating the insulating film forming step and the insulating film curing and patterning step at least once" as recited in Applicants' claim 1.

Further, as argued in the Request for Reconsideration filed February 9, 2004, Brebels et al. clearly teaches that only a single patterning step is preformed. The Examiner alleged, in the paragraph bridging pages 7 and 8 of the Office Action dated April 19, 2004, that "column 19 lines 37-39 [of Brebels et al.] specify the thickness 'd2' of a single layer of low dielectric photo-BCB to be in the range of 1-50 μ m (e.g., d2 = 20

Serial No. 10/035,400
November 16, 2004
Reply to the Office Action dated August 18, 2004
Page 6 of 9

μm , etc.) and column 20 lines 4-7 [of Brebels et al.] describe patterning of a single layer of low dielectric material that is 20 μm thick." In the next sentence, the Examiner divines that "This suggests that each 20 μm thick low dielectric layer was deposited and patterned separately."

First, the Examiner has failed to explain why a patterning step would be required between each step of spin coating a low dielectric layer.

Second, contrary to the Examiner's allegations, Brebels et al. does not teach or suggest that the thickness of a "single layer" (which the Examiner alleged corresponds to "an insulating film" as recited in Applicants' claim 1) is in the range of 1-50 μm . Lines 37-39 of column 19 of Brebels et al. disclose that "The thickness of d2 of the photo-BCB layer may be in the range 1 to 50 μm , e.g. d2=20 μm " (emphasis added). That is, Brebels et al. teaches that the thickness of the entire low dielectric layer (which includes a plurality of spin coated insulating film layers) is in the range of 1 to 50 μm , not that the thickness of a single spin coated layer or film is in the range of 1 and 50 μm . Thus, when Brebels et al. gives the example d2=20 μm , Brebels et al. is providing an example in which the thickness of the entire low dielectric layer is 20 μm . Further, the specific embodiment described in lines 4-7 of column 20 of Brebels et al. is directed to a patch antenna in which the entire low dielectric layer has the thickness, 20 μm , given in the example discussed in lines 37-39 of column 19 of Brebels et al.

Thus, contrary to the Examiner's allegation, Brebels et al. fails to teach more than one step of patterning the low dielectric layer.

Therefore, Brebels et al. clearly fails to teach or suggest the step of "curing and patterning the insulating film" as recited in Applicants' claim 1 and certainly fails to teach or suggest the step of "repeating the insulating film forming step and the insulating film curing and patterning step at least once" as recited in Applicants' claim 1.

The Examiner has relied upon Kornrumpf et al., Carey et al., Ohya et al., and Trinh et al. to allegedly cure various deficiencies in Brebels et al. However, none of Kornrumpf et al., Carey et al., Ohya et al., and Trinh et al. teaches or suggests the steps

Serial No. 10/035,400
November 16, 2004
Reply to the Office Action dated August 18, 2004
Page 7 of 9

of "curing and patterning the insulating film" and "repeating the insulating film forming step and the insulating film curing and patterning step at least once" in combination with the other method steps recited in Applicants' claim 1.

In addition, the Examiner alleged that it would have been obvious to "to carry out the photolithographic process of making a microwave or milli-wave module (or circuit) as taught by Brebels [et al.] using a ceramic (e.g. alumina, etc.) substrate 25-100 mils (0.635-2.54 mm) thick... as taught by Kornrumpf [et al.]," and further, that it would have been obvious to use "a ceramic substrate having flexural strength of at least 408kgf/cm² to avoid cracking of the substrate or circuit during handling or processing as disclosed by Ohya [et al.]." In other words, the Examiner alleged that it would have been obvious to substitute both the substrate of Kornrumpf et al. and the substrate of Ohya et al. in the process of making a microwave or milli-wave module of Brebels et al. This is clearly incorrect and completely improper.

The Examiner has attempted to rely upon one reference (Kornrumpf et al.) to teach a substrate having the recited thickness and another reference (Ohya et al.) to teach a substrate having the recited flexural strength. However, the Examiner has failed to provide any reference which teaches a substrate having both the recited thickness and the recited flexural strength.

In essence, the Examiner has alleged that it would have been obvious to use two different substrates in the process described in Brebels et al. This is clearly improper. At best, it might have been obvious to use the substrate of either Kornrumpf et al. or Ohya et al., but clearly not both of the substrates of Kornrumpf et al. and Ohya et al. Since the substrate of Kornrumpf et al. includes a combination and arrangement of materials that are completely different from the combination and arrangement of materials of the substrate of Ohya et al., it clearly would NOT have been obvious to use two different substrate having completely different combinations and arrangements of materials in the process of Brebels et al.

Instead of basing the conclusion of obviousness on actual teachings or

Serial No. 10/035,400
November 16, 2004
Reply to the Office Action dated August 18, 2004
Page 8 of 9

suggestions of the prior art and the knowledge of one of ordinary skill in the art at the time the invention was made, the Examiner has improperly used Applicants' own invention as a guide. It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious. The Federal Circuit has previously stated that one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. In re Fritch, 972 F.2d 1260, 23 USPQ 2d 1780, 1784 (Fed. Cir. 1992).

Accordingly, Applicants respectfully submit that Brebels et al., Kornrumpf et al., Carey et al., Ohya et al., and Trinh et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of features and method steps recited in claim 1 of the present application.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Brebels et al. in view of Kornrumpf et al., further in view of Carey et al., further in view of Ohya et al., and further in view of Trinh et al.

In view of the foregoing amendments and remarks, Applicants respectfully submit that claim 1 is allowable. Claims 2 and 3 depend upon claim 1, and are therefore allowable for at least the reasons that claim 1 is allowable.

In view of the foregoing amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

Serial No. 10/035,400
November 16, 2004
Reply to the Office Action dated August 18, 2004
Page 9 of 9

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

Date: November 16, 2004


Attorneys for Applicants

Joseph R. Keating
Registration No. 37,368

Christopher A. Bennett
Registration No. 46,710

KEATING & BENNETT LLP
10400 Eaton Place, Suite 312
Fairfax, VA 22030
Telephone: (703) 385-5200
Facsimile: (703) 385-5080